

## Northern Ireland Surgical Trainees: Prize Day November 2003

**Abstracts from the Northern Ireland Surgical Trainees Prize Day, which was held on Friday 14 November 2003 and hosted by Altnagelvin Area Hospital at the City Hotel, Londonderry. Thirty-nine abstracts were submitted of which eleven were accepted for presentation on the day. There were six in the SHO section and five in the Specialist Registrar section. Winner of the SHO section was Dr Peter Mallon and runner-up was Conor Marron. Winner of the SpR section was Mr Damian Mole and runner-up was Ms Janne Bingham.**

### THE IMPACT OF A COMPLIANT ROTA ON SHO TRAINING EXPERIENCE AND SERVICE COMMITMENT

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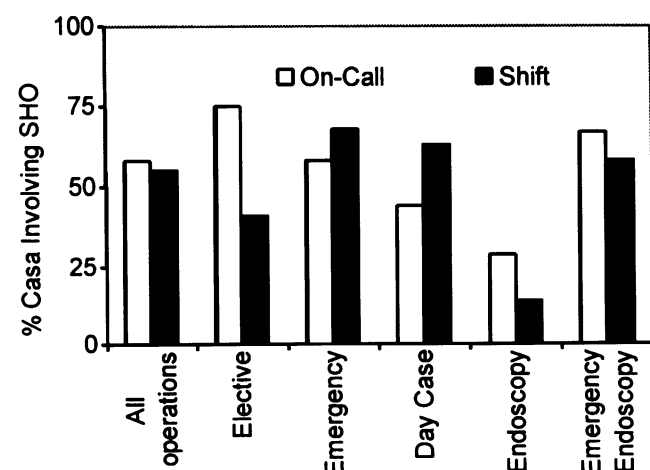
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#### Introduction

Reduction of junior doctors hours has been driven by health care modernisation, and legislation. Effective reduction has been achieved by the introduction of shift working. This change is not universally accepted, many feel it is detrimental to training and clinical exposure. The aim of this study was to determine the impact of these changes on clinical exposure/experience.

#### Methods

The activities of a cohort of six senior house officers (SHO's) in a general surgical unit were assessed. Information was collected over two consecutive six week periods before and after switching from an "on-call" to a full shift rota. Working pattern information was obtained from, hours monitoring forms, outpatient correspondence, theatre/endoscopy registers, and logbooks.



#### Results

A total of 792 operations, 710 endoscopies, and 2649 outpatient episodes were analysed. Total hours worked was reduced by the shift system, however, a larger proportion of the hours worked was during the out-of-hours period. Total outpatient and operative throughput did not change.

With the shift system the total number or proportion of operative cases attended did not significantly change. There was a 37% reduction in SHO attendance at inpatient elective cases. Attendance at emergency operations and day case surgery increased by 17% and 42% respectively. There was a marked reduction in exposure to endoscopy and outpatient management (Table).

#### Conclusion

Change to a shift system leads to reduction in clinical exposure in some key areas. However, increased exposure is noted in emergency and day case experience. If the shift system is not adequately structured valuable learning opportunities may be wasted. Optimising timetable and shift planning may allow adequate and appropriate training opportunities in the available time.

### PROMOTING EFFECT OF GASTRO-DUODENAL REFLUX ON OESOPHAGEAL TUMORIGENESIS

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Background

There appears to be a link between gastro-oesophageal reflux disease and rising incidence of oesophageal cancer in the West. We hypothesised that increasing severity of reflux enhances proliferation and tumour formation with or without exposure to dietary carcinogen (methyl-n-amyl nitrosamine, MNAN). To achieve this we created a first model of mild to moderate reflux by surgically destroying the cardiac and pyloric sphincter (Model I). The severe reflux model consisted of side to side anastomosis of duodenum with lower oesophagus without gastric bypass (Model II).

Methods

Sprague Dawley (8 week old, male) rats were randomly assigned to 6 groups (as per Table). MNAN (25mg/kg/wk) was injected intraperitoneally at the age of 10 weeks or two weeks following surgery to Group E for one week, and remaining groups for four weeks. The experiment was terminated when the animals reached 38 weeks of age. The study was approved by animal ethics committee.

Results

Hyperproliferative ulcerative lesions (including tumours) increased with severity of the reflux, from 15% in Model I to 81% in Model II with mutagen treatment, ( $p<0.01$ ). Highest tumour yield was in Group F ( $p<0.05$ ). None of the animals in the study suffered weight loss. Twelve animals failed to complete the study.

TABLE						
	Group A Control (n=7)	Group B MNAN (n=15)	Group C Model I (n=15)	Group D Model II (n=15)	Group E Model II+ MNAN (n=15)	Group F Model II (n=15)
Animals completed study	7	15	13	11	13	11
Tumours	0	3(20%)	0	1(9%)	0	5(45%)
Polypoid lesions	0	8(54%)	0	0	0	2(18%)
Hyperproliferative ulcerative lesions	0	0	2(15%)	8(72%)	3(23%)	9(81%)
Normal oesophagus	7	7(47%)	11(85%)	3(27%)	10(77%)	2(18%)
Weight gain in 30 weeks(gms)	299±57	260.7±58.5	245.8±19	291.5±54.7	201.8±25	223±52.8

Conclusions

Gastro-duodenal reflux promotes epithelial proliferation, tumour formation and enhances cancer risk of a dietary mutagen. This stresses the role of anti-reflux treatment.

DOES IRRITABLE BOWEL SYNDROME INFLUENCE THE INCIDENCE OF POST CHOLECYSTECTOMY SYMPTOMS IN THE LAPAROSCOPIC ERA?

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Aim

An increase in the number of cholecystectomies performed has been noted during the laparoscopic era. Some authors have suggested that this may be due to diagnostic confusion caused by symptoms related to irritable bowel syndrome (IBS). This study aimed to determine whether IBS was causing diagnostic confusion resulting in unnecessary operations being carried out in the laparoscopic era.

Methods

Questionnaires were sent to two patient cohorts who had undergone cholecystectomy between 1988-1990 (open) and 1998-2000 (laparoscopic). Patients were asked about pain, jaundice and indigestion pre- and postoperatively. Questionnaires also incorporated Rome II criteria for the diagnosis of IBS and SF-36 quality of life data. The histological severity of gallbladder disease in both groups was assessed by a single pathologist.

Results

124 of 196 patients in the open group and 264 of 400 patients in the laparoscopic group replied. There was no difference between the groups in gender, age at surgery, incidence of pre-operative symptoms, or the presence of positive Rome II criteria. A higher percentage of patients who had open cholecystectomy had relief of pain compared to the laparoscopic group (81% vs. 70.6%:  $p<0.05$ )\*. There was no difference in the incidence of IBS in patients who had persistent pain (open 50.0%; laparoscopic 50.0%;  $p=1.0$ ) or any symptoms post-cholecystectomy (open 40.0%; laparoscopic 43.5%;  $p=0.85$ ). There was no difference between the groups with regards any of the 8 domains specified within the SF-36 data. The mean histological scores of gallbladder disease were similar in both groups.

Conclusions

While there is a significant increase in the incidence of post cholecystectomy pain in the laparoscopic group this cannot be attributed to IBS and does not appear to influence quality of life.

\* Fishers exact test

## **DOUBLE CONTRAST BARIUM ENEMAS – HOW FREQUENT ARE REPORTS INCONCLUSIVE AND WHAT ACTION IS TAKEN?**

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### **Introduction**

Double contrast barium enema (DCBE) in combination with flexible sigmoidoscopy (FS) is considered an adequate means of visualizing the colorectum. In addition to the financial implications of an inconclusive investigation, clinicians are faced with the problem of ongoing management. With a perceived increase in the number of inconclusive DCBE reports and requests for follow-up endoscopic visualization, the aim of this study was to evaluate actual numbers of each.

### **Methods**

Reports of all DCBEs performed in the Ulster Hospital in the calendar year 2001 were obtained from radiology computerized records. Reports were divided into 3 main groups: i. Diagnostic (normal enema or definite mucosal lesion); ii. Complete technical failure; iii. Inconclusive report. The latter reports were further subdivided into 4 groups according to the reason for inadequate views: a. Poor bowel preparation; b. Moderate/severe diverticular disease (DD); c. Possible polyp advising endoscopic visualization; d. Miscellaneous group – ‘other’ reasons. Charts of all patients in ‘inconclusive’ group were retrieved and reviewed.

### **Results**

Of 2036 DCBEs performed in 2001, radiologists were confident with the enema (definite pathology or normal) in 1749 (86%). There were 77 (4%) technical failures and 210 (10%) ‘inconclusive’ DCBE’s. Of the 210 inconclusive enemas, the reason stated was poor bowel preparation in 58 (23%), DD in 70 (33%), possible mucosal polyp recommending ‘direct visualisation’ in 54 (26%) and 28 (13%) for ‘other’ reasons. Charts were unavailable in 3 (1.4%) patients and 11 (5.2%) patients did not attend for follow-up. In 30 (14%) patients FS had already been carried out pre-DCBE, with 1 abnormality detected. In 96 (46%) patients the referring clinician considered further investigations inappropriate. In 70 (33.3%) patients further investigations (rigid/FS or colonoscopy) were arranged, 35 of whom were

from the ‘direct visualisation recommended’ subgroup. Of 70 endoscopies, 19 (27%) had an abnormality which correlated to that queried on DCBE, and 10 of these 19 were from the ‘direct visualisation’ sub-group.

### **Conclusion**

A significant number of DCBE reports are inconclusive. The yield of significant mucosal pathology with further endoscopic investigations is low. Outpatient review and clinical risk reassessment is recommended before arranging further investigations in patients with inconclusive DCBE reports.

## **THE PREVALENCE OF SEXUAL DYSFUNCTION IN MALE PATIENTS FOLLOWING ABDOMINAL AORTIC ANEURYSM REPAIR IN NORTHERN IRELAND**

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### **Objective**

To investigate the frequency of sexual dysfunction in male patients following abdominal aortic aneurysm (AAA) repair in Northern Ireland.

### **Methods**

After an initial screening by telephone contact, a questionnaire-based survey using the validated Sexual Health Inventory for Men (SHIM) was carried out on 142 male patients who underwent open or endovascular AAA (elective and ruptured) repair between April 1999 to July 2002. A SHIM score <21 predicts erectile dysfunction. Demographics, medical history including pre-existing sexual dysfunction, prostate surgery, smoking status and sexual history, operative details and postoperative quality of life (QoL) data were obtained.

### **Results**

56 (40%) patients replied [26 elective open (EO), 21 endovascular (EVR) and 9 ruptured open (RO) repair]. The mean age was 69 (EO), 73 (EVR) and 70 (RO) years old. The prevalence of sexual dysfunction preoperatively was 27% (EO), 63% (EVR) and 45% (RO). About 35% (EO), 33% (EVR) and 33% (RO) admitted to be sexually inactive. Postoperative sexual dysfunction was 58% (EO), 76% (EVR) and 67% (RO). The proportion of patients with postoperative erectile dysfunction (SHIM score <21) was 70% (EO), 95% (EVR) and 78% (RO). The QoL was worsened in 55% (EO), 75% (EVR) and 50%

(RO) postoperatively. None of patients had any discussion about sexual dysfunction preoperatively. Only 8% (EO), 14% (EVR) and 22% (RO) of patients had sexual dysfunction discussed with their clinician post-surgery.

### Conclusion

The prevalence of pre- and post-operative sexual dysfunction is high in male patients who underwent AAA repair. While it is a sensitive issue which is seldom discussed, it poses a significant impact on patient's QoL postoperatively. Elective open repair results in a significantly higher increase of sexual dysfunction compared to endovascular procedure.

### SURVIVAL FROM BREAST CANCER IN NORTHER IRELAND – WHAT REALLY MATTERS?

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### Background

Cancer survival outcomes for patients in the UK are poorer than in Europe and US. Cancer Services reorganisation aims to address this through concentrating care in high volume settings because a positive relationship between high volume and better survival has been reported. However, these studies have inadequate adjustment for casemix, a major determinant of outcome. We examined this issue among patients with breast cancer in Northern Ireland.

### Methods

Records of all patients with invasive primary breast cancer in Northern Ireland diagnosed during 1996 (N=809) were reviewed in 1997 and again in 2002. Patient, disease and service variables and treatment decisions and date of death as of 31/12/2001 were extracted. Deaths were corroborated using death registrations. Cox Proportional Hazards models were used to examine the relationship of patient, disease and service variables to the risk of death.

### Results

Among 807 (99%) patients traced for follow up, there were 262 deaths. The overall 5 year survival was 68%. Advancing age, late stage disease, poor Nottingham prognostic index, and higher social deprivation (Townsend score), were independently associated with lower survival

( $p < 0.05$ ). A survival advantage for radiotherapy treated patients was evident (OR 0.65, 95%CI 0.47-0.90), and hormonal therapy (OR 0.49, 95%CI 0.30- 0.83). Using  $\geq 30$  cases pa to distinguish high/low volume, survival was lower for patients treated in low volume settings (OR 1.40, 95%CI 1.08-1.82) after adjustment for casemix.

### Conclusions

Patient and disease variables, radiotherapy and hormonal therapy are the major determinants of outcome for patients with breast cancer. There is limited evidence to support a small advantage to treatment in a high volume setting. Residual confounding by casemix is a strong possibility.

### THE ADMINISTRATION OF ENTERAL FATTY ACID REDUCES THE GUT DYSFUNCTION CAUSED BY METHOTREXATE ADMINISTRATION

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### Background

A side effect of methotrexate (MTX) administration is gastrointestinal inflammation. This study investigated the effect of enterally administered fish oils on gut mucosal structure and barrier function in an experimental animal model of MTX induced mucositis.

### Methods

Sprague-Dawley rats were randomized into 4 groups (n=20 per group). One group received 2.5mls/kg of MaxEPA fish oil, one group received 5.0mls/kg of MaxEPA fish oil, one group received isocaloric safflower oil and one group received 20mls/kg water. Each treatment was administered twice daily by orogastric gavage for ten days. On day seven each animal received 5.0mg/kg MTX by subcutaneous injection for three consecutive days. Food intake and body weight were recorded daily. On day eleven intestinal permeability was assessed by measuring urinary excretion of intragastric <sup>14</sup>C-labelled polyethylene glycol 4000. At laparotomy on day twelve, blood was sampled for measurement of plasma EndoCAB and IL-6 concentrations and small bowel excised for assessment of inflammation. Statistical analysis was performed using the Mann-Whitney U test with significance taken as  $p < 0.05$ .

## Results

When compared to the group receiving water, MaxEPA administration increased food intake ( $p=0.000$ ) and reduced plasma EndoCAb ( $p=0.000$ ) and IL-6 ( $p=0.017$ ) concentrations. Doubling the dose of MaxEPA caused weight gain ( $p=0.000$ ) and improved intestinal permeability ( $p=0.041$ ) in addition to increased food intake ( $p=0.000$ ), EndoCAb ( $p=0.000$ ) and IL-6 ( $p=0.030$ ) concentrations. It also reduced small bowel inflammation ( $p<0.05$ ). When compared to the group receiving isocaloric safflower oil, neither dose of MaxEPA improved food intake, weight gain, small bowel inflammation, intestinal permeability or plasma EndoCAb or IL-6 concentration ( $p>0.05$ ).

## Conclusions

MTX induces small bowel mucositis. Administration of 5.0mls/kg enteral omega-3 fatty acid reduces the gut mucosal barrier dysfunction caused by MTX when compared with water but not with an isocaloric control. The observed improvement in gut mucosal barrier function may simply reflect a supplemental calorific effect.

## INTESTINAL INTRAMUCOSAL pH AS AN INDICATOR OF LONG TERM PROGNOSIS IN PATIENTS UNDERGOING AORTIC SURGERY

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## Introduction

The development of intestinal intramucosal acidosis has been shown to be predictive of bowel ischaemia. It is thought that the release of myocardial depressant factor from the ischaemic bowel may be responsible for cardiac complications following abdominal aortic aneurysm repair. However, it is possible that cardiac insufficiency during aortic surgery may result in intestinal ischaemia. The aim of this study is therefore to assess if sigmoid ischaemia is a prognostic indicator of cardiac morbidity and mortality.

## Materials and methods

Thirty-eight patients undergoing elective AAA repair were recruited. Demographic details and risk factors for heart disease were recorded. Sigmoid pH<sub>i</sub>, as an indicator of ischaemia, was measured using a silicone tonometer in all patients during and for 24h after operation. Seven years

following surgery the patients and their general practitioners were contacted to determine the patient's health.

## Results

Within the follow-up period, 22 patients had died, 3 post-operatively. Eight patients died of cardiac failure or myocardial infarction. There was no significant difference in the demographic and risk factor details between the cardiac and non-cardiac deaths. However there was a strong positive correlation between those with preoperative angina and those who developed cardiac complications postoperatively ( $r=0.76$ ). There was no difference in aortic clamp time and operation time between the two groups. No correlation was observed between clamp time and pH<sub>i</sub>. The pH<sub>i</sub> in patients with cardiac related deaths ( $6.9\pm0.007$ ) was significantly lower than those with non-cardiac related deaths ( $7.1\pm0.006$ ,  $p<0.05$ ). Similarly, patients who suffered cardiac events following AAA repair had lower pH<sub>i</sub> ( $6.9\pm0.05$ ) compared to those who did not ( $7.1\pm0.05$ ,  $p<0.05$ ).

## Conclusion

The results suggest that global hypoperfusion as a result of an under performing heart may be partly responsible for the sigmoid ischaemia in patients following AAA repair. Therefore, low sigmoid pH<sub>i</sub> may be a useful prognostic indicator of cardiac complications in this group of patients.

## TNF ALPHA, IL-1BETA AND IL-6 PRODUCTION BY THE ISOLATED PERFUSED LIVER IN RESPONSE TO A "SECOND HIT" OF PORTAL ENDOTOXIN IS NOT ENHANCED BY EXPERIMENTAL SEVERE ACUTE PANCREATITIS

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## Background

Severe acute pancreatitis (AP) may enhance hepatic cytokine production in response to a "second hit", such as portal endotoxaemia resulting from gut-barrier dysfunction.

## Aim

To evaluate liver cytokine production in response to a "second hit" of portal endotoxin during severe AP.

## Methods

Twenty-four rats were randomized into 3 groups: AP (n=10), sham-operated (n=8), and non-operated controls (n=6). Severe AP was induced at laparotomy by intraductal glycodeoxycholate injection and intravenous caerulein infusion. 18hr after induction of AP a "second hit" of endotoxin (10µg/kg over 10min) was delivered into the portal vein in an isolated liver perfusion system. TNF-alpha, IL-1beta and IL-6 were measured in effluent perfusate collected at 30-40min and 90-100min into perfusion. Liver viability was assessed by oxygen consumption, biochemistry, histology and electron microscopy. Kupffer cell populations were quantified by immunohistochemistry.

## Results

A systemic inflammatory response to AP was demonstrated by elevated haematocrit, metabolic acidosis and 20% mortality.

At 18hr a pronounced transhepatic serum IL-6 gradient was observed in AP: 96pg/ml (portal) vs 621pg/ml (IVC) ( $P<0.001$ , Wilcoxon). Sham/control IL-6 was undetectable. IL-1beta was elevated in AP and sham serum. In AP, a small transhepatic serum IL-1beta gradient was detected: 64pg/ml (portal) vs 74pg/ml (IVC) ( $P<0.025$ , Wilcoxon). Serum TNF-alpha was <6pg/ml in all groups.

"Second hit": Portal endotoxaemia stimulated hepatic TNF-alpha production by 90-100mins: AP: 61pg/ml; sham: 112pg/ml; control: 61pg/ml;  $P=0.864$  between groups; 90-100mins vs. 30-40mins,  $P<0.001$  for each group (Kruskal-Wallis). No IL-6 or IL-1beta was detected at 90-100mins in any group.

Observation of normal smooth endoplasmic reticulum, mitochondria, oxygen consumption and minor vacuolation indicated minimal liver disruption.

Normal ED1-positive Kupffer cell distributions were seen in perfused livers.

## Conclusion

Transhepatic pro-inflammatory cytokine gradients occur during experimental severe AP in rats. The isolated perfused liver TNF-alpha, IL-1beta and IL-6 production response to portal endotoxin is not differentially enhanced in severe AP.

## ATTENUATION OF THE "SECOND HIT"-INDUCED HEPATIC CYTOKINE RESPONSE IN OBSTRUCTIVE JAUNDICE USING NOVEL ANTI-ENDOTOXIN PEPTIDES

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## Background

Therapeutic intervention in patients with obstructive jaundice (OJ) may be regarded as a second hit, capable of increasing endotoxaemia with subsequent exaggerated hepatic proinflammatory cytokine production. The aim of this study was to assess the efficacy of novel anti-endotoxin peptides (P6 and C1) in attenuating the hepatic TNF± and IL-6 response to a second hit of portal endotoxaemia in OJ.

## Methods

Core endotoxin-binding peptides were generated using biopanning of a pVIII random linear phage library with Lipopolysaccharide from *Salmonella minnesota Re995*. A nine-amino acid peptide, P6\*, was developed which was shown to inhibit LPS-induced TNF± secretion by human monocytic cells and a second peptide, C1, was generated by substituting amino acids of complimentary charge to the original. Bile duct ligation was performed on 15 Male Wistar rats which were randomised to receive either (A) endotoxin (LPS) alone (n=5), (B) LPS + P6 (n=5) or (C) LPS + C1 (n=5) during in-situ hepatic perfusion performed over 2 hours, 1 week post surgery. Effluent perfusate was collected for cytokine analysis (TNF± and IL-6) at 20 min intervals.

## Results

Repeated measures analysis over time of the effluent TNF± and IL-6 concentrations between the three groups (A, B and C) was carried out. TNF±: There was a significant difference in effluent levels between the three groups ( $p=0.04$ ) with post hoc analysis (Duncan's test) demonstrating significantly lower concentrations of TNF± in groups B and C compared to A. IL-6: There was no significant difference in effluent levels between the three groups ( $p=0.16$ ) using repeated measures analysis but at 2 hours there appeared to be higher levels of IL-6 in group A.

### Conclusion

These novel anti-endotoxin peptides, capable of attenuating the LPS-induced exaggerated hepatic cytokine response, may offer an exciting new therapeutic strategy for reducing intervention - related complications in OJ.

### OPTIMISING BOWEL PREPARATION FOR OUT-PATIENT FLEXIBLE SIGMOIDOSCOPY: A PROSPECTIVE RANDOMISED SINGLE BLIND COMPARISON OF THREE METHODS

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#### Introduction

Flexible Sigmoidoscopy is a routine investigation for colorectal symptoms. One phosphate enema has been the standard bowel preparation for out-patient sigmoidoscopy but provides adequate preparation in only 80% of patients. This study aimed to compare two methods of bowel preparation with the current standard in an attempt to improve efficacy and acceptability.

#### Methods

Patients attending for out-patient flexible sigmoidoscopy from January to September 2003 were randomised to 3 groups:- Group 1: One Fleet enema two hours pre-procedure; Group 2: Two Fleet enemas, one during evening prior to sigmoidoscopy and one two hours pre-procedure; Group 3: Lactulose 30mls orally 48 and 24 hours prior to sigmoidoscopy plus a single Fleet enema two hours pre-procedure. A questionnaire was used to assess efficacy, side effects, and patient tolerance. Endoscopists completed questionnaires regarding preparation quality.

#### Results

261 patients (Group 1:n=105; Group 2:n=81; Group 3:n=75) were included; endoscopist data was available for 251 (Group 1:n=97; Group 2:n=79; Group 3:n=75). No difference was noted between the groups with regards age, gender, procedure indication, or grade of endoscopist.

	Easy to use	Assistance required	No cramps/ pain	Alternate method preferred	Quality of preparation Excellent/ good
Group 1	94%	19%	48%	18%	83%
Group 2	85%	11%	46%	28%	88%
Group 3	87%	24%	36%	23%	73%
P value	0.09 <sup>1</sup>	0.15 <sup>1</sup>	0.35 <sup>1</sup>	0.25 <sup>1</sup>	0.04 <sup>1</sup>

There was no difference in the quality of preparation of patients in Group 1 vs. Group 2 ( $p=0.39^2$ ) or Group 1 vs. Group 3 ( $p=0.13^2$ ). However, two Fleet enemas gave superior preparation compared with the lactulose + Fleet group ( $p=0.02^2$ ).

#### Conclusions

The addition of a Fleet enema or oral lactulose over and above a single fleet enema gives no significant improvement in acceptability or efficacy.

<sup>1</sup> Chi-squared; <sup>2</sup> Fishers exact test